ABSTRACT

The invention disclosed a mixed-mode fuel injector with micro-variable-circularorifice (MVCO), which is a fuel injection device for internal combustion engines, either
diesel or gasoline engines. The fuel injector is a high-accuracy couple of components
comprising a needle valve (1) and a nozzle body (5). Said needle valve is movable back
and forth and received in said nozzle body to provide an opening position for fuel
injection and a biased closing position. Said nozzle body has multiple-micro-channels (6)
on the inner conical surface (C) close to the tip of the nozzle body. The injector has a
MVCO (4) comprising a micro-variable-circular aperture and multiple-micro-channels,
and has means of generating variable mixed-mode sprays of conical and multi-jet shapes,
with a major homogeneous conical spray at low to medium injection loads.